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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In the Application of Klaus Hartmann et al

Ser.No.: 09/651,797

Filed: August 30, 2000

For: METHOD AND APPARATUS FOR TREATMENT OF METALLIC WORKPIECES

Assistant Commissioner for Patents

Washington, DC 20231

INFORMATION DISCLOSURE STATEMENT

In accordance with 37 CFR § 1.56, Applicant wishes to call the attention of the Examiner to the following references:

- 1) DE 94 00 222.3
- 2) DE 296 03 022
- 3) XP-000755094
- 4) DE 30 28 901
- 5) DE 32 00 577
- 6) WO 00/18972

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Reference 1, G 94 00 222.3, discloses a multi-chamber furnace for the thermal treatment of metallic workpieces, and includes at least one heating chamber and a cooling chamber that is supplied with cooling gas. To conduct a cooling gas in a prescribed direction relative to the surface of the workpieces, there is disposed in the cooling chamber

at least one nozzle plate 10 and also at least one cooling plate 11 for heat exchange in the vicinity of at least one workpiece surface.

Reference 2, DE 296 03 022, which has a corresponding European application equivalent of EP 079 6920, discloses that Gas quenching equipment for metal parts, having a vertically adjustable nozzle plate (5) above the parts (3) arranged on a grid (2), allowing a substantially vertical flooding of the parts (3) with a quenching gas, the distance between the nozzle plate and the top surface of the parts (3) being variable up to 7 times the nozzle diameter d.

Reference 3, Article XP-000755094, titled "Furnace and Charge Influence Upon The Heat Transfer Index during Gas Quenching" discloses among other things this article discusses the influence of the furnace construction. Fig. 13 shows a cross-section of a cold chamber of an RVTC furnace. Differences are discussed with a vertical flow depending upon the type of nozzle system.

Reference 4, DE 30 28 901, discloses an apparatus for quenching hard material stacked on a grating of a charge support structure by lowering the grating via an elevator into a treatment shoot within a temperature regulated bath that is provided with bath circulation devices. The fluid stream produced by the circulation devices is guided to below the lowered grating via guide plates, flow channels or the like. Connected to the elevator are one or two deflection bodies 2,3 that contain one or more deflection channels 4,5,6,7,8,11, and in the lowered position of the elevator the treatment shoot is connected with the bath via this deflection channel or channels.

Reference 5, DE 32 00 577, discloses a device for quenching material being hardened by immersion into a liquid, flowing quenching agent has a quenching agent trough,

quenching shaft, immersion device and circulating device. The quenching shaft is made in the form of an air duct with an inlet nozzle and a constant section. It is adjoined by a horizontal partition which divides the quenching agent trough into an upper trough region and a lower trough region. The inlet nozzle of the air duct is connected to the partition in such a way that the constant section protrudes into the lower trough region. The quenching agent can be introduced by means of the circulating device from the lower trough region into the upper trough region and via the quenching shaft back into the lower trough region. In this way, especially elongate material being hardened can be uniformly quenched in the device.

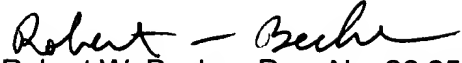
Reference 6, WO 00/18972, discloses a method for cooling metal components highly heated in a chamber includes effecting a uniform cooling of an entire metal component. The metal component has regions each with a given mass, some of the regions having a larger mass than others of the regions. Housings are provided around regions with the relatively larger masses. The regions are subjected to the inert cooling gas in a controlled manner to a differing extent based upon the mass size. The housings are individually subjected separately with the inert cooling gas. A treatment device for cooling metal components includes a reservoir for holding inert cooling gas and a chamber for receiving a metal component to be cooled. The chamber is connected to the reservoir and has a housing for each of the regions with the larger mass. Each of the housing has an inlet orifice separately connected to the reservoir.

Copies of the listed documents are submitted herewith along with the form PTO-1449.

It is respectfully requested that any fees required and not enclosed herewith or any shortages in any fees be charged to Deposit Account 02-1653.

Consideration of the foregoing in relation to this application is respectfully requested.

Respectfully submitted,



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